

WHAT IS CLAIMED IS:

1. A method for exhausting a gas from an apparatus for cooling a fuel cell, which generates power by supplying air and a fuel gas, in which a cooling liquid is circulated between the
5 fuel cell and a heat exchanger,

said method comprising: separating the gas from the cooling liquid, mixing the separated gas with the air supplied to or exhausted from said fuel cell, and then exhausting the gas.

10

2. The method according to claim 1, wherein the gas mixed with air supplied to the fuel cell is introduced into a cathode of the fuel cell.

15

3. An apparatus for cooling a fuel cell, which generates power by supplying air and a fuel gas, having a circulation passage for circulating a cooling liquid between the fuel cell and a heat exchanger,

said apparatus possessing a cooling liquid storage
20 container, which stores parts of the cooling liquid within said circulation passage, communicated with said circulation passage via gas drawing passage, and communicated with said circulation passage via a passage for returning a cooling liquid,

25

wherein said cooling liquid storage container is communicated with a supply air pipe, which supplies air into

the fuel cell, or with an exhaust pipe, which exhausts the air from the fuel cell, via a signal pressure pipe, and

wherein the air incorporated into said signal pressure pipe from the supply air pipe side or from the exhaust air pipe side is pushed back towards said supply air pipe or said exhaust air pipe to be exhausted in said supply air pipe or said exhaust air pipe when the pressure of the gas separated from the cooling liquid flowing from the circulation passage through said gas drawing passage and stored in said cooling liquid storage container is higher than the pressure of the supply air within said supply air pipe or the pressure of the exhaust air within said exhaust air pipe.

4. The apparatus according to Claim 3, wherein the pressure of the air supplied into the fuel cell through the supply air pipe or the pressure of the air exhausted from the fuel cell through the exhaust air pipe is changed whereby the gas is exhausted into said supply air pipe or said exhaust air pipe.

20

5. The apparatus according to Claim 4, wherein the pressure within said signal pressure pipe is increased to be not less than a prescribed pressure and then returned to the stationary pressure.

25

6. The apparatus according to Claim 3, wherein the

pressure of the air supplied into the fuel cell through the supply air pipe or the pressure of the air exhausted from the fuel cell through the exhaust air pipe is changed when the pressure difference between the pressure of the gas within said cooling liquid storage container and the pressure within the
5 air within the supply air pipe or between said cooling liquid storage container and the pressure within the exhaust air pipe is not changed over a prescribed period.

10 7. The apparatus according to Claim 3, wherein the pressure of the air supplied to the fuel cell from the supply air pipe is changed when the fuel gas concentration within said cooling liquid storage container is not less than a prescribed concentration.

15

 8. The apparatus according to Claim 3, wherein the pressure of the air supplied to the fuel cell from the supply air pipe is changed when the fuel gas concentration within said cooling liquid storage container is considered to be increased.

20

 9. An apparatus for cooling a fuel cell, which generates power by supplying air and a fuel gas, having a circulation passage for circulating a cooling liquid between the fuel cell and a heat exchanger,

25 said apparatus possessing a cooling liquid storage container, which stores parts of the cooling liquid within said

circulation passage,

said cooling liquid storage container possessing
a liquid phase portion communicated with said
circulation passage via gas drawing passage, and
5 a gas phase portion which is communicated with a
supply air pipe, which supplies air into said fuel
cell via a flow-in pipe, and which mixes the gas
separated from the cooling liquid within said
liquid phase portion with the air flowing therein
10 thorough said flow-in pipe from said supply air
pipe.

10. The apparatus according to Claim 9, wherein said
gas phase portion possesses means for detecting a fuel gas,
15 which detects the internal fuel cell concentration.

11. The apparatus according to Claim 10, which
possesses pressure control means, which pushes back the gas
within said gas phase portion to said supply gas pipe or to an
20 exhaust gas pipe from the fuel cell, when the fuel gas
concentration within said gas phase portion is not less than
a prescribed concentration.

12. The apparatus according to Claim 11, wherein said
25 pressure control means is means, which increases the pressure
within said signal pressure pipe to be not less than a prescribed

pressure and then returns the pressure to a stationary pressure.

13. An apparatus for cooling a fuel cell, which generates power by supplying air and a fuel gas, having a
5 circulation passage for circulating a cooling liquid between the fuel cell and a heat exchanger,

said apparatus possessing a cooling liquid storage container, which stores parts of the cooling liquid within said circulation passage,

10 said cooling liquid storage container possessing
a liquid phase portion communicated with said circulation passage via gas drawing passage, and
a gas phase portion which is communicated with a supply air pipe, which supplies air into said fuel
15 cell via a flow-in pipe and via a flow-out pipe,
and which mixes the gas separated from the cooling liquid within said liquid phase portion with the air flowing therein thorough said flow-in pipe from
said supply air pipe, and returns the mixed gas into
20 said supply air pipe via said flow-out pipe,

said flow-in pipe being communicated with said supply air pipe at an upstream portion of a humidifier, which is provided on the way to said supply air pipe and which humidifies the air to be supplied to said fuel cell, and said flow-out pipe being
25 communicated with said supply air pipe at a downstream of said humidifier.

14. The apparatus according to Claim 13, wherein said cooling liquid storage container possesses means for detecting a fuel gas, which detects the internal fuel cell concentration.

5 15. An apparatus for cooling a fuel cell, which generates power by supplying air and a fuel gas, having a circulation passage for circulating a cooling liquid between the fuel cell and a heat exchanger,

said apparatus possessing

10 a cooling liquid storage container, which stores parts of the cooling liquid within said circulation passage, communicated with said circulation passage via gas drawing passage, and communicated with said circulation passage via a passage for returning a cooling
15 liquid, and

an air pipe in which air supplied to or exhausted from said fuel cell flows, and

said cooling liquid storage container possessing
a gas exhaust mechanism, which is communicated with
20 said air pipe via a ventilation pipe, and which exhausts the fuel gas stayed in said cooling liquid storage container out of the system by a ventilation current flowing within said ventilation pipe.

25 16. The apparatus according to Claim 15, wherein a flow amount of said ventilation current is controlled depending upon

the fuel gas concentration within said cooling liquid storage container.

17. The apparatus according to Claim 16, wherein a
5 ventilation amount within said cooling liquid storage is increased when the fuel gas concentration within said cooling liquid storage container arrives at a prescribed concentration or more.

10 18. The apparatus according to Claim 17, wherein the gas within said cooling liquid storage container is exhausted by said gas exhaust mechanism, when the pressure within said air pipe is increased whereby said fuel gas concentration within said cooling liquid storage container is decreased to a
15 prescribed concentration.

19. The apparatus according to Claim 16, wherein the pressure within said cooling liquid storage container is decreased to increase the flow amount of said ventilation
20 current when the fuel gas concentration within said cooling liquid storage container arrives at a prescribed concentration or more.